

REMARKS

Claims 1-31 are pending in the present application with claim 31 having been added by way of this Amendment. Applicants appreciate the Examiner's careful consideration and favorable treatment of the present application in which claims 17-19 were indicated as being allowable, if properly rewritten.

Claims 1-16 and 20-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Omura in view of Schuster. Applicants respectfully traverse this rejection on the following grounds.

Applicants respectfully contend that the Examiner has slightly misinterpreted the Omura reference for the following reasons. The Examiner states that Omura has a numerical aperture of 0.85 based on col. 29, line 37; however, this line recites that "Naw 0.75" and thus, the value of the numerical aperture is 0.75 and not 0.85 as the Examiner contends. The specification supports this position since all of the tables indicate that the numerical aperture is 0.75. The secondary Schuster reference does not cure this deficiency since the Schuster reference only teaches numerical apertures between 0.7 and 0.75. Thus, the projection lens of claim 1 is clearly not disclosed or suggested by either of these reference since the claimed numerical aperture of 0.85 is neither disclosed nor suggested by the references. Reconsideration and allowance of claim 1 are in order since this feature is completely absent in the references.

Secondly, the Examiner states that the Omura has a 1 1/2 waist at lenses L 17, L 18 of Fig. 13. Applicants respectfully submit that a 1/2 waist, as defined in the present application, is completely lacking in the cited Omura reference. On page 2 of the present application, the 1/2 waist is defined as being a waist having a diameter between 95% and 90%, with lesser diameters defining regular waists as opposed to a 1/2 waist. Table 7 of Omura gives data of the Fig. 13 embodiment. The minimum effective diameter at lenses L 17, L 18 is at surfaces 14, 15 and therefore is about 61.5 mm. The effective diameter immediately before this is at surface 13 and is 70.5 mm. And thus, a comparison between the two diameters (61.5 mm and 70.5 mm) yields a value of only 80%. The value is far less if it is compared to the antecedent local maximum of 83.5 mm at L 14 surface

no. 7. In other words, this is clearly a regular waist as also is stated at the part cited by the Examiner at col. 32, lines 66-67, where it is stated that “Fig. 13is a double waist”. Accordingly, the reference itself does not claim that the arrangement is a 1 1/2 waist arrangement but rather, is a double waist. Consequently, Omura does not teach a 1/2 waist arrangement and thus, the claim element is lacking in the claimed invention.

The Examiner’s reference to col. 4, lines 1-4, is not understood since it clearly is not related to waist structure but rather relates to asphere form details. Moreover, the addition of the surface distances d0 and WD of Table 1 of Omura yields a track length of approximately 1m. Consequently, Omura has no reason to do any change and to look out for any teaching for measures to reach or maintain such a distance between object and image plane, as the Examiner suggests for combination with the Schuster reference.

Accordingly, claim 1 contains a number of features that are clearly neither disclosed nor suggested by any of the references, either taken alone or in combination. Reconsideration and allowance are respectfully requested.

In addition, Applicants respectfully submit that a number of dependent claims also contain patentable subject matter in and of themselves. For example, with respect to claim 5, the “L%” is interpreted as “L5”. No hint is given or can be found, why Schuster would disclose a 1/2 waist. The [0024] paragraph does not discuss such. Even from a look at Fig. 2, it is clear, that at lenses L 7, L 8, the beam diameter is less than 90% of the diameter at L 4, L 5, so that this is therefore, a normal waist. In addition, claim 5 recites “a most object forward lens” which in Schuster’s Fig. 2 is a lens L1, being negative. Thus, the Examiner’s argument is not truly related or on point with respect to claim 5.

With respect to claim 10, Schuster’s Fig. 2, table 2, has an image field height (65 in table 2) of 14 mm, at a given reduction ratio of 1/4, this is equivalent to an object height of 4 x 14 mm = 56 mm. The maximum beam/lens height at surfaces 8/9, i.e., lens L 4 is 79.9 mm. Accordingly, this is clearly and significantly more and therefore, the Examiner’s argument does not hold.

With respect to claim 11, the limitation given in Omura at col. 3 and not col. 2 as recited by the Examiner, line 4 is $C_b/C_a > 1.6$. Applicants respectfully point out to the Examiner that Applicant's claim is $C_a/C_b > 1.6$. Thus, the inverse of Omura's quotient is claimed. Reconsideration and allowance are respectfully requested. The same holds true for claims 12-14.

With respect to claim 15, Applicants respectfully repeat the argument recited above with respect to claim 1. In other words, Omura does not have a $\frac{1}{2}$ waist as previously recited. In addition, the language cited by the Examiner actually relates to a double waist and not the recited waist arrangement.

With respect to claim 16 and 20, Applicants traverse the contention that it would be routine for optical designers to enter or remove aspherical surfaces from a complicated optical design as set forth in claim 1 and shown in the disclosed embodiment of the present application. Even after a combination of the Omura and Schuster references, it is still required to add on specific selections in the specific theme of selecting aspherical surfaces; however, Applicants ponder why at all is the specialist motivated at all to address just this theme in fact.

With respect to claim 21, Applicants believe that the Examiner argument treats an aperture as just being like a plate with a hole in it, which could be made larger just at will. However, the numerical aperture of a projection lens is a delicate optical property (no "further limiting"). Increasing it is not "further limiting" (notoriously without reducing imaging quality) but instead requires substantial design efforts, more lenses, more aspheres, more sophistication necessary, as well known in the art. The benefit is substantial. The basic task of microlithography, increase of resolution, is obtained. The cited art is far from the recited 0.92, with only values of 0.7 to 0.75 being disclosed in the cited art. Thus, the claimed feature is neither disclosed nor shown in the cited references.

With respect to claim 22, Applicants respectfully repeat the argument recited previously with respect to claim 1. In other words, the Omura reference does not show a $\frac{1}{2}$ waist. Further, the Examiner gives no argument as to why the specialist starting from Omura would have had any

reason why to combine Schuster, and if so, why to take just the claimed feature from this cited reference.

With respect to those claims dependent from claim 22, Applicants respond as follows. The rejection of claim 24 is traversed for the same reasons recited above with respect to claims 1 and 21, namely, that the claimed feature is not disclosed or suggested by Omura. With respect to claim 25, the other lens group is defined in base claim 22. Clearly, the lenses L 6 - L8 and L 10 do not fit into this definition, as there is no antecedent first negative lens group more object wise. With respect to claim 27, the second sentence is copied from the argument concerning claim 26 and therefore does not particularly relate to claim 27 on the basis that Applicants do not see where the Examiner sees 9 aspheric surfaces. Further clarification is requested.

With respect to independent claim 29, this claim has been amended to clarify that the term secondary waist refers to a $\frac{1}{2}$ waist and therefore the two terms are interchangeable. Applicants have added the expression "1/2" to claim 29 to clarify this matter. Page 5, line 7, of the specification supports this change.

Applicants respectfully traverse the rejection of claim 29 for at least the same reason recited above as to claim 1 is allowable, namely that neither Omura nor Schuster nor a combination thereof recites a projection lens having a $\frac{1}{2}$ waist. Reconsideration and allowance of claim 29 are respectfully requested.

Further, with respect to claim 29, it is to be noted that Schuster (paragraph [0024]) in no way is related to aspeheres or diameters of light. Also, those skilled in the art would not fully comprehend the Examiner's argument since aspheres and allowed diameter of light are in no directly linked. Aspheres are a designer's tool for optimizing error correction of optics.

Based on the foregoing, reconsideration and allowance of claim 29 are earnestly solicited.

The rejection of claim 30 is respectfully traversed for the same reasons as those recited above in connection with the discussion of claim 1. As a result, reconsideration and allowance of claim 30 are respectfully requested.

Newly added claim 31 should be allowed as depending from what should be an allowed independent claim 30.

Claim 17 has been rewritten into independent form by including the subject matter of claim 1 and therefore, based on the Examiner's indication that claim 17 contains allowable subject matter, Applicants respectfully submit that claim 17, as amended, is in condition for allowance.

Claim 18 has been rewritten into independent form by including the subject matter of claim 1 and therefore, based on the Examiner's indication that claim 18 contains allowable subject matter, Applicants respectfully submit that claim 18, as amended, is in condition for allowance.

Claim 19 has been rewritten into independent form by including the subject matter of claim 1 and therefore, based on the Examiner's indication that claim 19 contains allowable subject matter, Applicants respectfully submit that claim 19, as amended, is in condition for allowance.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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